USDA NRCS

United States Department of Agriculture
Natural Resources Conservation Service

Rapid Watershed Assessment

Gunpowder-Patapsco Watershed

*Rapid watershed assessments provide
initial estimates of where conservation
investments would best address the
concerns of landowners, conservation
districts, and other community organizations
and stakeholders. These assessments help
landowners and local leaders set priorities and
determine the best actions to achieve their goals.*

*Helping People Help the Land*

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Preface

The Natural Resources Conservation Service (NRCS) is initiating rapid watershed assessments in order to increase the speed and efficiency generating resource information to guide conservation implementation, as well as the speed and efficiency of putting it into the hands of local decision makers. While these rapid assessments provide less detail and analysis than full-blown studies and plans, they do provide a foundation for watershed studies or area planning. In addition, the assessments provide the benefits of NRCS locally-led planning for resource conservation and conservation program implementation in less time and at a reduced cost than more complex studies.

Rapid watershed assessments will be valuable for Farm Bill program delivery, and provide useful information for county, watershed and regional planners. These assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments can help landowners and local leaders set priorities and determine the best actions to achieve their goals.

To produce the assessments, quantitative and qualitative data is collected and organized to create a watershed profile using Geographic Information System (GIS) technology. The data is analyzed to allow resource concerns and conditions to become apparent, and to generate maps and information to help people make better decisions about conservation needs and programs.


/s/ Craig R. Derickson
Pennsylvania State Conservationist
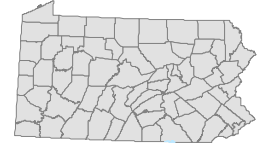
Introduction

The Gunpowder-Patapsco Watershed is located in southern York County in Pennsylvania. The majority of the watershed is in Maryland. The watershed is over 911,000 acres of which only 7133 acres are in Pennsylvania. One Service Center of the Natural Resources Conservation Service, one County Conservation District and the Capital Resource Conservation and Development Council offices provide assistance to this watershed.
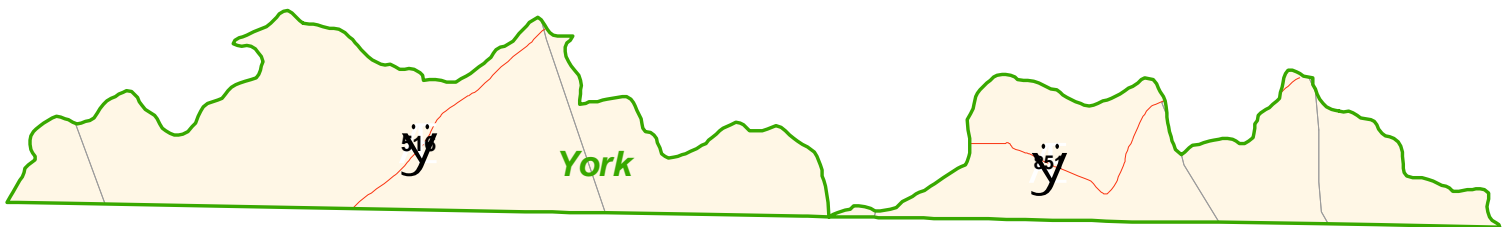

York

|	Acres in HUC	% Acres of HUC
York	7150.4	100
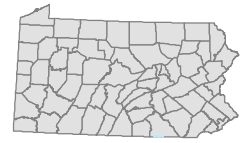
Common Resource Area (CRA) [1]

148 - Northern Piedmont: Most of the CRA is an eroded part of the Piedmont Plateau. It is mostly gently sloping or sloping. Intrusive dikes and sills form fairly sharp ridges within the less steep terrain. Soils are moderately deep to very deep, moderately well drained to somewhat excessively drained, and loamy to loamy-skeletal. Farms are mostly crops, forage crops, soybeans, and grain for diary cattle.
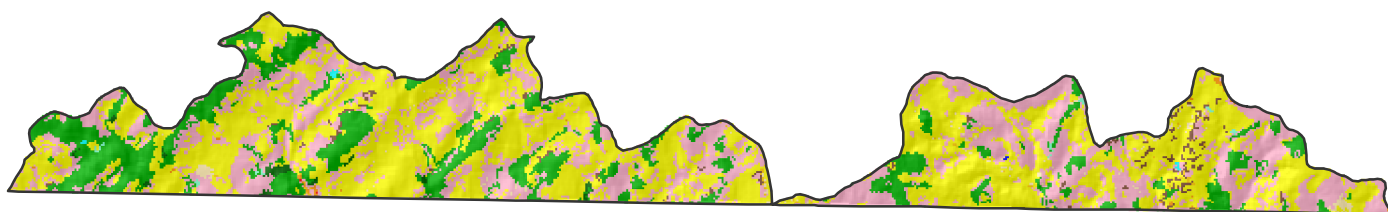
148
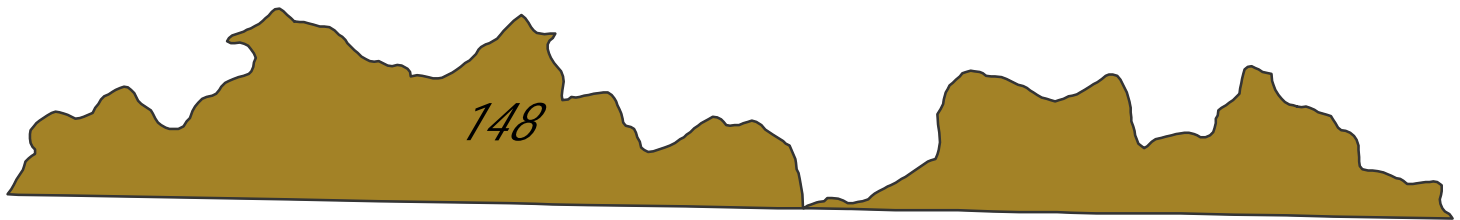
Elevation [2]

Elevation in the Gunpowder-Patapsco Watershed ranges from 1100 feet (335 meters) at it's high point to 709 feet (216 meters) at a low point.

1100 Feet

709 Feet
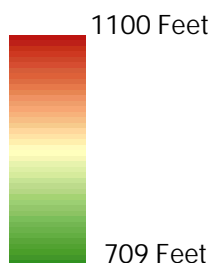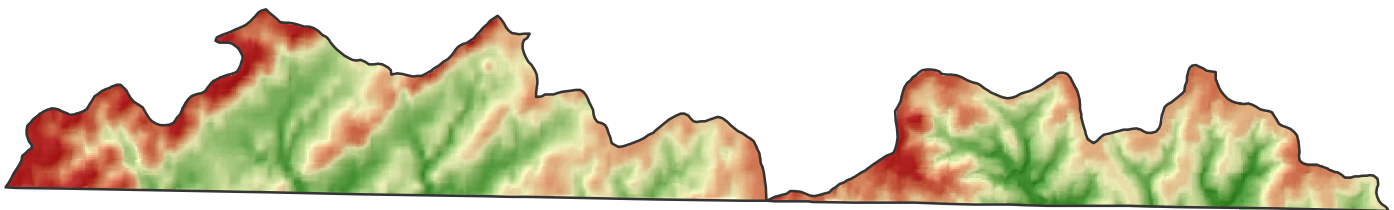
Land Use / Land Cover 2001[3]

		Acres	Percent
🔵	Water	.8	-
⬭	Developed, Open Space	54.0	.8
🟡	Developed, Low Intensity	20.7	.3
🟠	Developed, Medium Intensity	13.1	.2
🔴	Developed, High Intensity	.6	-
⬭	Barren Land (Rock, Sand, Clay)	80.8	1.1
🟢	Deciduous Forest	1252.9	17.6
🟢	Evergreen Forest	29.7	.4
🔵	Mixed Forest	0	-
🟡	Pasture / Hay	3423.1	48.0
🌸	Cultivated Crops	2237.7	31.4
⬭	Woody Wetlands	11.0	.2
🔵	Emergent Herbaceous Wetlands	5.8	-
☐	County Boundary		

Average Annual Precipitation (Inches)[4]

40 - 42

42 - 44
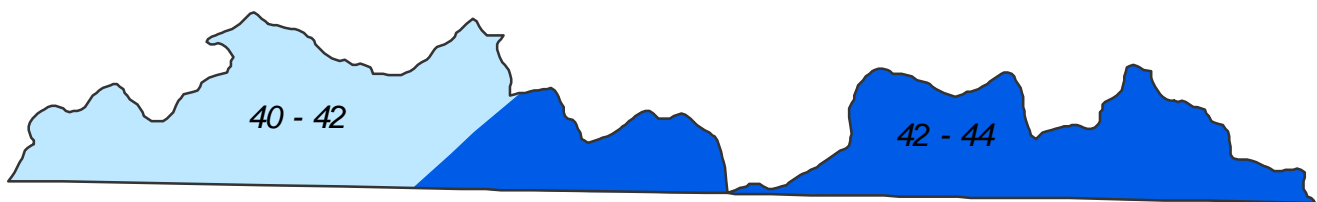
National Wetlands Inventory[5]

Wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface.

NWI digital data files are records of wetlands location and classification as developed by the U.S. Fish & Wildlife Service. The classification system was adopted as a national classification standard in 1996 by the Federal Geographic Data Committee.
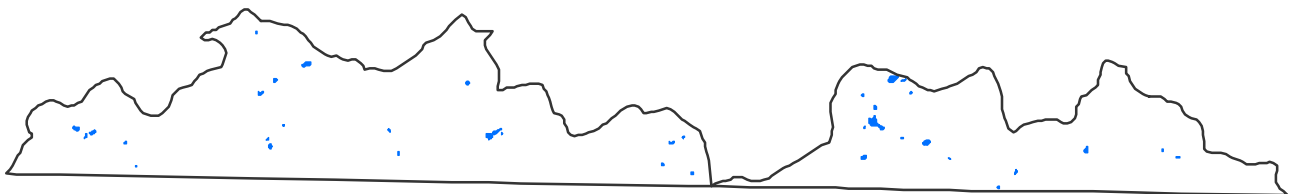
National Wetlands Inventory
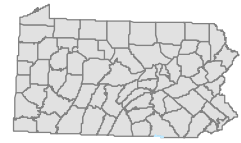
Water Resource Points[6]

A Water Resource is a DEP primary facility type related to the Water Use Planning Program. The sub-facility types related to Water Resources that are in the Gunpowder-Patapsco Watershed are:

Discharge: represents the return of water used at a Water Resources primary facility. The subfacility type may be a sewage treatment plant, instream discharge, spray irrigation field, groundwater recharge, on-lot septic or an unidentified facility type.

Ground Water Withdrawal: represents the withdrawal of water used at a Water Resources primary facility. The subfacility type may be a well, spring, quarry, infiltration gallery, deep mine, surface mine or an unidentified facility type.

b   Discharge

b   Ground Water Withdrawal

    Townships

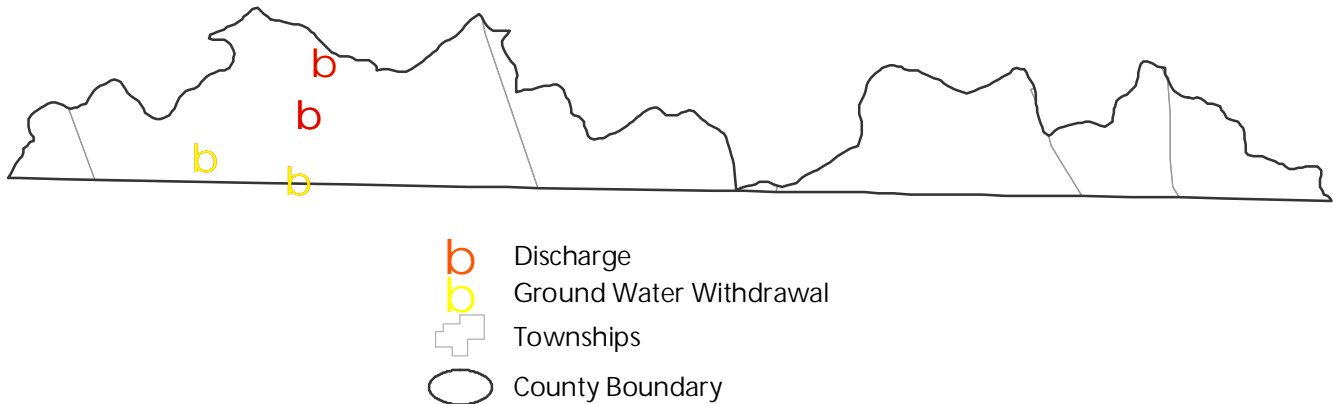   County Boundary

Pennsylvania Breeding Bird Atlas[7]

The 1st Pennsylvania Breeding Bird Atlas (1992) assesses the distribution of breeding birds across the state. The areas below are confirmed breeding areas for species. Fourteen birds species from Pennsylvania's state Wildlife Action Plan associated with agricultural landscapes were focused on in this assessment, not all have confirmed breeding area in this watershed.

Redheaded Woodpecker

    Townships

    County Boundary
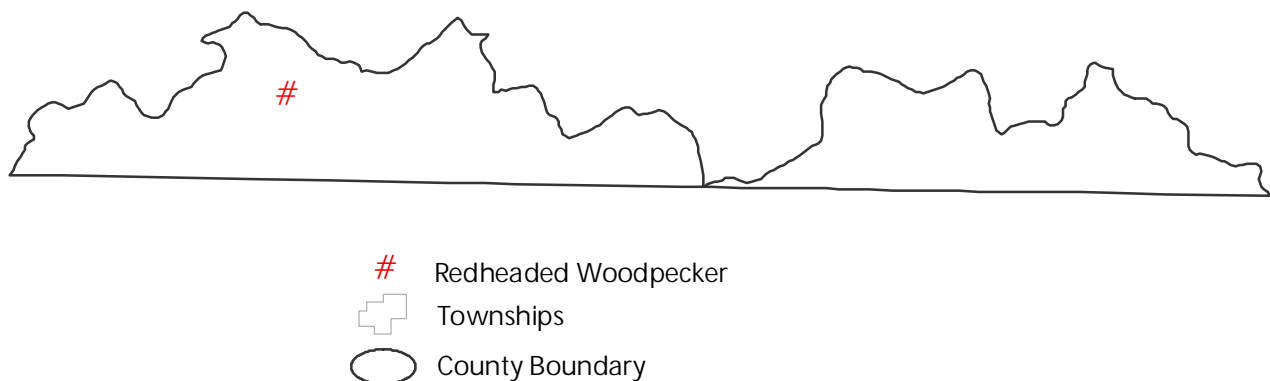
Soils [8]
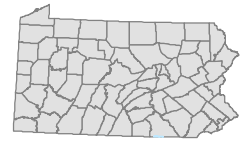
Drainage Classification

Drainage class (natural) refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized -- excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."
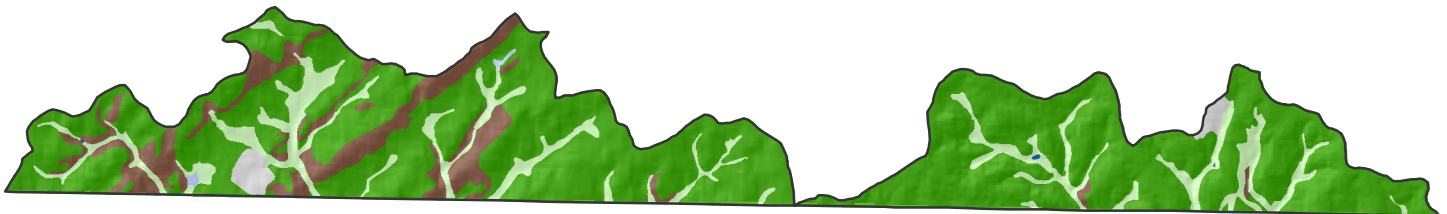
Drainage Classification

		% Area
	Excessively - Somewhat excessively drained	11.4
	Well drained	75.2
	Moderately well drained	11.7
	Somewhat poorly drained	-
	Poorly - Very poorly drained	.2
	Water	.1
	Unclassified	1.4
	County Boundary	
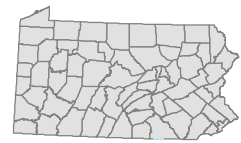
Farmland Classification

Farmland classification identifies soil map units as prime farmland,
farmland of statewide importance, farmland of local importance,
or unique farmland. Farmland classification identifies the
location and extent of the most suitable land for producing
food, feed, fiber, forage, and oilseed crops. NRCS policy and
procedures on prime and unique farmlands are published
in the Federal Register, Vol. 43, No. 21, January 31, 1978.
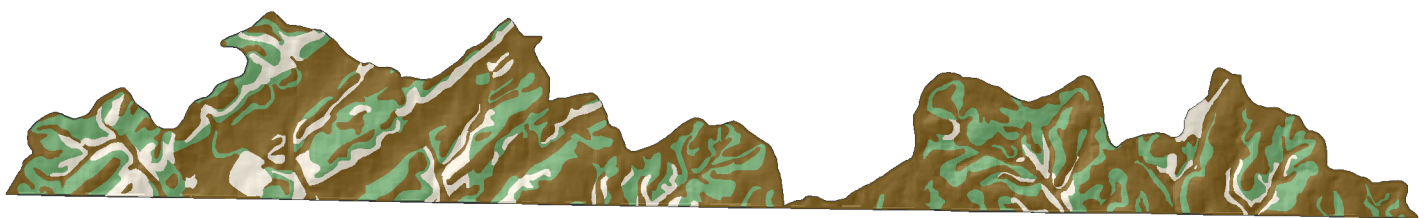
Farmland Classification

		% Area
	All areas are prime farmland	55.5
	Farmland of statewide importance	31.5
	Not prime farmland or statewide importance	13.0
	County Boundary	
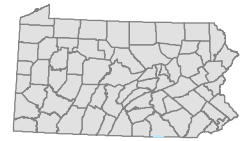
Hydric Soil Classification

This rating provides an indication of the proportion of the map unit that meets criteria for hydric soils. Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.
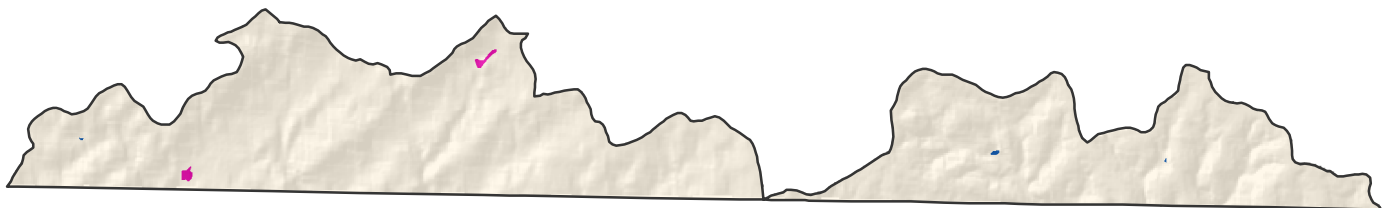
Hydric Classification

		% Area
	Not Hydric	99.7
	Partially Hydric	-
	All Hydric	.2
	Water	.1
	County Boundary	
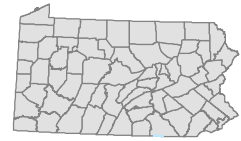
Highly Erodible Land

A soil map with an erodibilty index (EI) of 8 or greater is considered to be highly erodible land (HEL). The EI for a soil map unit is determined by dividing the potential erodibility for the soil map unit by the soil loss tolerance (T) value established for the soil in the FOTG as of January 1, 1990. Potential erodibility is based on default values for rainfall amount and intensity, percent and length of slope, surface texture and organic matter, permeability, and plant cover. Actual erodibility and EI for any specific map unit depends on the actual values for these properties.
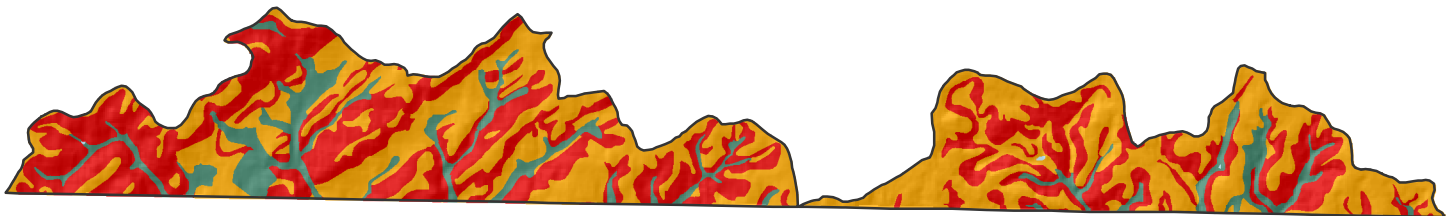
Erosion Classification	% Area
Not highly erodible land	11.4
Potentially highly erodible land	45.8
Highly erodible land	42.7
Water	.1
County Boundary	
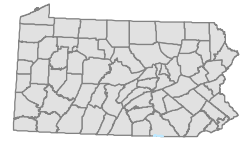
Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations that show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

Land Capability Classification

		% Area
■	Well Suited (Capability Class 1 -2)	54.7
■	Moderately well suited (Capability Class 3)	29.6
■	Poorly suited (Capability Class 4 -5)	6.4
	Unsuited (Capability Class 6 - 8)	8.2
	Unclassified	1.1
▢	County Boundary	
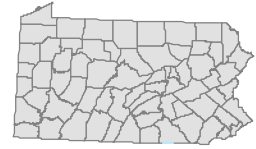
Cropland on Highly Erodible Land

There are 896.4 acres on highly erodible land, which is approximately 40% of all the cultivated cropland in the watershed.
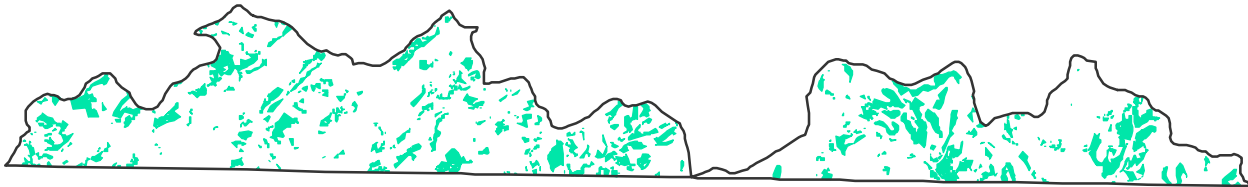
Cropland on Hydric Soils

There are only 3.5 acres on hydric soils, which is approximately .2% of all the cultivated cropland in the watershed.

Cropland on Poor or Unsuited Soils

There are 234.6 acres on hydric soils, which is approximately 10.5% of all the cultivated cropland in the watershed.
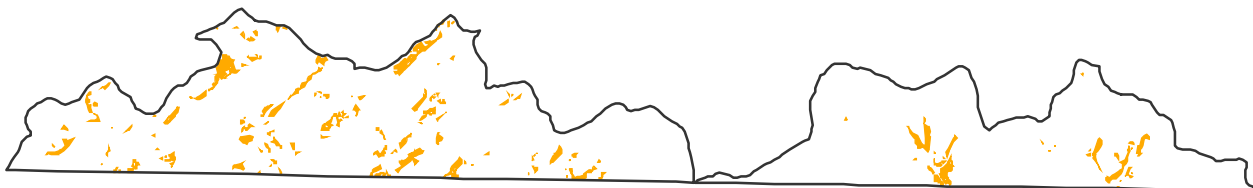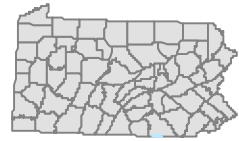
Resource Concerns

Major resource concerns in the area include:
- erosion
- degradation of soil quality
- degradation of stream quality
- conversion of nonurban land to urban land

Conservation Practices

Common conservation practices for cropland:
- crop rotations
- cover crops
- contour farming
- crop residue management
- grassed waterways
- diversions
- terraces
- stripcropping

PRS Performance Measures[9]

	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06	Total
Total Conservation Systems Planned (acres)	0	0	0	0	150	NA	99	283	532
Total Conservation Systems Applied (acres)	0	0	0	0	60	NA	53	326	439
Key Conservation Treatments									
Waste Storage Facility (number)	0	0	0	0	0	0	1	0	1
Riparian Forest Buffer (acres)	0	0	0	0	0	0	0	0	0
Erosion Control Total Soils Saved (tons/year)	0	0	0	0	0	NA	NA	NA	0
Nutrient Management (acres)	0	0	0	0	50	8	0	111	169
Pest Management (acres)	0	0	0	0	0	0	29	0	29
Prescribed Grazing (acres)	0	0	0	0	0	8	0	0	8
Tree and Shrub Establishment (acres)	0	0	0	0	0	0	0	0	0
Residue Management (acres)	0	0	0	0	0	100	38	169	307
Wildlife Habitat (acres)	0	0	0	0	150	0	0	0	150
Wetlands Created, Restored, or Established	0	0	0	0	0	0	0	0	0
Acres in Conservation Programs									
Conservation Technical Assistance									
Planned	0	0	0	0	0	NA	63	283	346
Applied	0	0	0	0	0	NA	38	317	355
Conservation Reserve Program									
Planned	0	0	0	0	108	NA	20	0	128
Applied	0	0	0	0	60	NA	0	0	60
Environmental Quality Incentive Program									
Planned	0	0	0	0	41	NA	21	0	62
Applied	0	0	0	0	0	NA	16	9	25
Farmland Protection Policy/Farm and Ranch Lands Protection Program									
Planned	0	0	0	0	0	NA	0	0	0
Applied	0	0	0	0	0	NA	0	0	0
Forestry Incentive Program									
Planned	0	0	0	0	0	NA	0	0	0
Applied	0	0	0	0	0	NA	0	0	0
Grasslands Reserve Program									
Planned				0	0	NA	0	0	0
Applied				0	0	NA	0	0	0
Grazing Lands Conservation Initiative									
Planned	0	0	0						0
Applied	0	0	0						0
Wildlife Habitat Incentive Program									
Planned	0	0	0	0	0	NA	0	0	0
Applied	0	0	0	0	0	NA	0	0	0
Wetlands Reserve Program									
Planned	0	0	0	0	0	NA	0	0	0
Applied	0	0	0	0	0	NA	0	0	0

NA - Reporting was unavailabel by
Hydrologic Unit Code

14

Social and Census Data[10]

	York
Farms (number)	31
Land in farms (acres)	3,424
Total cropland (acres)	2,673
Principal operator by primary occupation - Farming (number)	15
Farms by Size	
1 to 9 acres	3
10 to 49 acres	16
50 to 179 acres	8
180 to 499 acres	2
500 to 999 acres	1
1,000 acres or more	1
Livestock and Poultry	
Cattle and calves inventory (farms)	10
Cattle and calves inventory - Beef cows (farms)	5
Cattle and calves inventory - Milk cows (farms)	2
Hogs and pigs inventory (farms)	1
Sheep and lambs inventory (farms)	2
Layers 20 weeks old and older inventory (farms)	2
Broilers and other meat-type chickens sold (farms)	0
Crops Harvested	
Corn for grain (acres)	891
Corn for silage or greenchop (acres)	140
Wheat for grain, all (acres)	280
Oats for grain (acres)	20
Barley for grain (acres)	55
Soybeans for beans (acres)	484
Forage - land used for all hay and all haylage, grass silage, and greenchop (acres)	484
Vegetables harvested for sale (acres)	40
Land in orchards (acres)	20
Total cropland harvested (acres)	2,361
Farm Operator by Ethnicity	
White	44
Black or African American	0
Asian	0
Hispanic	0
American Indian/Alaskan Native	0
Pacific Islander	0
Women	13
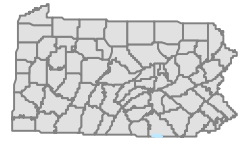
Partnership Groups:

A cooperative project involving NRCS and conservation partners, including:

- State Conservation Commission

- Pennsylvania Department of Environmental Protection

- Pennsylvania Game Commission

- Pennsylvania Grazing/Forage Lands Conservation Coalition

- Pennsylvania Fish & Boat Commission
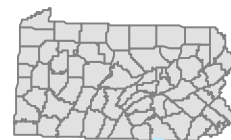
Footnotes/Bibliography

1. Common Resource Area

   Common Resource Area (CRA) delineation is defined as a geographical area where resource concerns, problems, or treatment needs are similar. More information can be found online at http://soils.usda.gov/survey/geography/cra.html

2. National Elevation Dataset (NED)

   The NED is a seamless mosaic of the best-available elevation data. The primary source data were the USGS 7.5-minute (30-meter or 10-meter resolution) DEM's. A hillshade grid was also created using the DEM and used to creare a 3-D effect. More inforamtion on NED can be found online at http://ned.usgs.gov/

3. Land Use / Land Cover 2001

   Land Use / Land Cover map was created using the National Land Cover Dataset. The National Land Cover Dataset was compiled from Landsat satellite TM imagery with a spatial resolution of 30 meters and supplemented by various ancillary data (where available). More inforamtion can be found online at http://landcover.usgs.gov/

4. Average Annual Precipitation

   The average annual precipitation data for this map layer were produced through a partnership between NRCS and the Spatial Climate Analysis Service at Oregon State University (OSU). The average annual precipitation is from 1961 through 1990. More information can be found online at http://www.ncgc.nrcs.usda.gov/products/datasets/climate/index.html

5. National Wetlands Inventory (NWI)

   The NWI maps do not show all wetlands since the maps are derived from aerial photointerpretation with varying limitations due to scale, photo quality, inventory techniques, and other factors. More information can be found online at http://www.fws.gov/nwi/

6. Water Resource Points

   A Water Resource is a DEP primary facility type related to the Water Use Planning Program. More information can be found http://www.depweb.state.pa.us/dep/site/default.asp

7. Pennsylvania Breeding Bird Atlas

   Data was taken for the 1st Pennsylvania Breeding Bird Atlas (1992). For this watershed assessment, fourteen bird species were chosen to be focused on. More information about all bird species can be obtained at http://www.carnegiemnh.org/atlas/home.htm

Footnotes/Bibliography

8. Soils

Soil Survey spatial and tabular data were used for the following survey areas:
York County (PA133)
Spatial and tabular data an be downloaded at http://soildatamart.nrcs.usda.gov/

9. Performance Results System (PRS)

PRS data was extracted from PRS by year, conservation system, conservation practice, and proagrams by hydrologic unit code. More information can be found online at the PRS homepage
http://ias.sc.egov.usda.gov/prshome/

10. Social and Census Data

Ag census data and ethnicity data were downloaded from the National Agricultural Statistics Service (NASS). The data was adjusted by percent of hydrologic unit in the county. More information can be found online at http://www.nass.usda.gov/Census_of_Agriculture/index.asp